

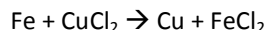
**T01D03 - Limiting Reactants Lab Activity**

Now that you have a theoretical knowledge of limiting and excess reagents, let's proceed with an activity that will allow you to understand the practical side of this topic.

Steel wool is considered an alloy, a combination of several metals held by a sea of delocalized electrons, in which iron (Fe) takes a majority of the mass. For our purposes we will assume that the steel wool is completely iron (in calculations). You will develop two experiments:

- A reaction where Iron (Fe) is the limiting reactant and copper (II) chloride ( $\text{CuCl}_2$ ) is in excess
- A reaction where copper (II) chloride ( $\text{CuCl}_2$ ) is the limiting reactant and iron (Fe) is in excess

Both reactions can be expressed in the following skeleton (unbalanced) equation:



You must quantitatively determine the percent yield in each case propagating for uncertainty throughout. You may work with a partner, where each of you will complete the opposite reaction.

Procedure:

- Do calculations ahead of time and determine a reasonable amount of each of your substances to use
- Your  $\text{CuCl}_2$  may be dissolved in DI water (the amount does not matter)
- You may use a filter to expedite your filtration and drying process. The oven may be used as well.
- Dispose of the Chloride ( $\text{FeCl}_2$  and  $\text{CuCl}_2$ ) solution properly